



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/544,126	08/02/2005	Tomohiko Aritsuka	403455	8648
23548 7590 04/09/2007 LEYDIG VOIT & MAYER, LTD 700 THIRTEENTH ST. NW SUITE 300 WASHINGTON, DC 20005-3960			EXAMINER KAPLAN, HAL IRA	
			ART UNIT	PAPER NUMBER
			2836	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/09/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/544,126

Applicant(s)

ARITSUKA, TOMOHIKO

Examiner

Hal I. Kaplan

Art Unit

2836

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4 and 6 is/are rejected.
- 7) ☒ Claim(s) 2 and 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 8/2/05, 3/29/06
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following minor informalities: Page 5, line 20 contains the phrase "referred to as the same meaning". It appears this should be "have the same meaning". The passage at page 7, lines 16-22 is unclear to the Examiner. Page 8, lines 16-18 contain the phrase "Because of this, as the AC-DC ... are employed". It appears this should be "Because of this, voltage sourced converters ... may be employed as the AC-DC converter units 510 to 540 of the power converter". Page 8, lines 18-20 state that it is not necessary for all of the converter units to produce the same voltage. Page 9, lines 5, 13, and 21, and page 10, line 6 contain the phrases "paralleled out" and "parallels out". It is not clear to the Examiner what this means. Page 10, lines 3-6 contain the phrase "consequently, if AC-DC ... paralleled out". This is unclear to the Examiner as written. It appears this should be "consequently, if redundant AC-DC converter units are provided, operation at the 100% rating of the power converter is possible even with the faulty AC-DC converter units disconnected".

Page 10, lines 21-22 state that the number of stages can be obtained by dividing the rating of the power converter by the product of the rated voltage and current of one stage. This is inconsistent with page 8, lines 19-20, which state that the stages can produce different voltages, which would mean that the number of stages differs depending on which specific stage is disconnected. It is also unclear what the "number of stages" refers to. For purposes of this Office Action, the Examiner has assumed that this is the number of stages necessary for the converter to produce the desired power

Art Unit: 2836

rating (Vsxls). The passage from page 10, line 23 - page 11, line 9 is unclear to the Examiner. This passage appears to be stating reasons for certain events. The phrases "normal times" at page 10, line 24 and "derated" at page 11, line 5 are unclear to the Examiner. Page 11, lines 19-20 contain the phrase "normally ... voltage of the secondary ... current of the secondary winding". It appears this should be "when the voltage across the secondary ... current through the secondary winding".

Page 12, line 1 contains the word "reversely". It is unclear to the Examiner what this means or what is reversed with respect to what. Page 12, lines 2-3 contain the phrase "employ a method of optimizing the ratings". It is unclear to the Examiner what this means. Page 12, lines 24-25, the phrase "not affected to the expected availability" is unclear to the Examiner. Page 14, line 25 and page 16, line 10 contain the word "manufactured". It appears this should be "used". The passages from page 14, line 25 - page 15, line 5 and page 16, lines 10-13 are unclear to the Examiner. It appears the phrase "when it is easier ... high rated current" should read "in this case". It is unclear why the specification describes manufacturing when the device is actually in use, but it appears that this is due to a minor mistranslation from an earlier-filed Japanese-language application. Page 17, line 23 contains the phrase "embodiment to the fifth". It appears this should be "embodiment and the fifth".

Page 18, lines 2-3 contain the phrase "by connecting not only a capacitor but some other energy-storing device". It is not clear to the Examiner whether the capacitor and the other device can both be connected, or whether either can be connected but not both. Page 18, lines 15-18 state that the DC circuits of the AC-DC converter units

can be connected to other AC-DC converter units. This seems to misdescribe the functionality of the system, as the output of the first converter units will be DC and thus would be applied to a DC-DC or DC-AC converter, but not another AC-DC converter. For purposes of this Office Action, the Examiner has assumed that converter units 513 to 543 are DC-AC converter units, as shown in Figure 7.

Appropriate correction is required.

### ***Drawings***

2. The drawings are objected to because of the following minor informalities: In Figures 1, 2, and 6-8, one end of the semiconductor switch (300) is floating, and one end of the transformer array is floating.
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 350-352, 360-362, 451, and 461 in Figure 2; and 901, 902, 911-914, 921-924, and 930 in Figure 3. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the

Art Unit: 2836

examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

4. Claims 1, 2, and 5 are objected to because of the following informalities: Claim 1, line 15 contains the phrase "respectively connected". It appears this should be "each respectively connected". Claim 2, line 5 and claim 5, line 6 contain the phrase "each of a respective common DC circuit". It appears this should be "a respective common DC circuit". Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1, 3, 4, and 6 rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese patent of Takuji et al. (10-028319) in view of the US patent of Stoupis et al. (7,154,722) and the US patent of Wilson (5,206,775).

As to claim 1, Takuji, drawn to a protective device for series compensation system, discloses a series transformer (3) having a primary winding connected in series with a line and having a secondary winding; multiple array transformers (6) having respective primary and secondary windings, the primary windings being connected in series and to the secondary winding of the series transformer (3); and AC-DC converter units (7), each AC-DC converter unit (7) having an AC side connected to the secondary winding of one of the array transformers (6); and mutually independent DC circuits (8) respectively connected to a DC side of one of the AC-DC converter units. Takuji does not disclose the claimed normally-on switches, normally-off current bypass devices, or bypass functionality.

Stoupis, drawn to loop control for distribution systems, describes a technique in which a faulty section of wire (317) is isolated via normally-on switches (302,303) respectively connected in series with the corresponding ends of the faulty section of wire (317) (see column 8, lines 36-42 and Figure 3C). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to have used the technique of Stoupis to isolate an individual AC-DC converter unit of Takuji, in order to provide efficient and more robust fault protection. Stoupis does not disclose the claimed normally-off current bypass devices or bypass functionality.

Wilson, drawn to a circuit bypass device, discloses a normally-off current bypass device (30) connected in series with a circuit (70,80), wherein, by turning on the current bypass device (30) it is possible to bypass a faulty unit (20). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to have used the

Art Unit: 2836

circuit bypass device of Wilson to provide a bypass for each of the AC-DC converter units and series normally-on switches of Takuji in view of Stoupis, in order to enable the other converter units to continue to function in the event of a fault, and not require a repairman to travel to the site of the fault to make repairs.

As to claims 3 and 6, none of the references disclose each of the array transformers including a plurality of transformers connected in series, but it would have been obvious to one of ordinary skill in the art, at the time of the invention, to have used a plurality of transformers connected in series for each array transformer, because it has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). See MPEP §2144.04 (VI)(B).

As to claim 4, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to have used an additional circuit bypass device as taught by Wilson, connected in parallel with all of the series-connected array transformers of Takuji in view of Stoupis, in order to allow the system to continue to operate in the event of faults in multiple converter units without having to open and close separate switches for each converter unit.

***Allowable Subject Matter***

8. Claims 2 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.



Art Unit: 2836

9. The following is a statement of reasons for the indication of allowable subject matter: Claims 2 and 5 contain allowable subject matter because none of the prior art of record discloses or suggests the claimed plurality of AC-DC converter units connected to each of the array transformers at the AC sides and connected to a respective common DC circuit at the DC sides, in combination with the remaining claimed features.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The US patents to Warrington (2,394,126), Paulsson (4,922,364), and Hammond et al. (5,986,909) disclose similar systems.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hal I. Kaplan whose telephone number is 571-272-8587. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2800 x36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2836

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

hik



BRIAN SIRCUS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800